

Amendments to the Claims:

This listing of claims will replace all prior versions and listing of claims in the application.

Claims 1, 2, 4, 7, and 10 are amended.

Claims 20 and 21 are new.

Listing of Claims:

1. (Currently Amended) A lead frame, comprising:
a frame; and
a plurality of inner leads, extending inward from the frame,
wherein the inner lead includes a protruded portion provided on a surface of its outer portion, the protruded portion protrudes in a thickness direction so as to have a thickness larger than an inner portion of the inner lead, and ~~[[a]]~~ at least one step portion is formed in a side portion on each of an inner and outer side portions of the protruded portion.
2. (Currently Amended) The lead frame according to claim 1, wherein ~~the step portion is formed as a portion with two steps or more~~ each of the inner leads is tilted to a side on which the protruded portion is formed toward an inner end of the inner lead.
3. (Withdrawn) A method of producing a lead frame, comprising:
forming a structure including a frame and a plurality of inner leads extending inward from the frame;
half-etching or pressing a part of a surface of the inner lead to form a protruded portion on the surface; and
then carrying out half-etching or pressing again from surroundings of a surface of the protruded portion to form a step portion in a side portion of the protruded portion.
4. (Currently Amended) A resin-encapsulated semiconductor device, comprising:
a semiconductor chip having a group of electrodes;

a plurality of inner leads that are arranged along a periphery of the semiconductor chip and are connected to the group of electrodes of the semiconductor chip, respectively; and

an encapsulating resin that encapsulates a connection part located between the semiconductor chip and the inner leads, with a part of each of the inner leads being exposed from the encapsulating resin to form an external terminal,

wherein the inner lead includes a protruded portion provided on a surface thereof on an outer side relative to the periphery of the semiconductor chip, the protruded portion protruding in a thickness direction so as to have a thickness larger than the inner portion of the inner lead with ~~[[a]]~~ at least one step portion formed in a side portion on each of the inner and the outer side portions of the protruded portion,

the group of electrodes of the semiconductor chip is connected to surfaces of inner portions of the inner leads located on an inner side relative to their protruded portions, through electroconductive bumps, respectively, and

the encapsulating resin encapsulates the semiconductor chip and the electroconductive bumps and is formed to expose surfaces of the protruded portions.

5. (Original) The resin-encapsulated semiconductor device according to claim 4, wherein the semiconductor chip includes a first semiconductor chip and a second semiconductor chip that is stacked on a surface of the first semiconductor chip and has a smaller size than that of the first semiconductor chip,

the protruded portions of the plurality of inner leads are located on an outer side relative to a periphery of the first semiconductor chip,

a first group of electrodes of the first semiconductor chip is connected with the surfaces of the inner portions of the inner leads located on the inner side relative to their protruded portions, through first electroconductive bumps, respectively,

the second semiconductor chip is disposed within a region surrounded by inner ends of the plurality of inner leads and is connected electrically with a second group of electrodes of the first semiconductor chip through second electroconductive bumps, and

the encapsulating resin encapsulates surfaces of the first and second semiconductor chips and the first and second electroconductive bumps.

6. (Original) The resin-encapsulated semiconductor device according to claim 4, wherein the surfaces of the protruded portions and an outer face of the encapsulating resin are substantially in the same plane.
7. (Currently Amended) The resin-encapsulated semiconductor device according to claim 4, wherein a back face of the [[first]] semiconductor chip and an outer face of the encapsulating resin are substantially in the same plane.
8. (Original) The resin-encapsulated semiconductor device according to claim 4, wherein back faces of the inner leads and an outer face of the encapsulating resin are substantially in the same plane.
9. (Original) The resin-encapsulated semiconductor device according to claim 4, wherein the inner lead is tilted gradually to a side on which the protruded portion is formed, toward an inner end of the inner lead.
10. (Currently Amended) The resin-encapsulated semiconductor device according to claim 4, wherein a plurality of ball electrodes are formed on the protruded portions.
11. (Original) The resin-encapsulated semiconductor device according to claim 4, wherein an insulating thin film is formed on a part of the surface of the protruded portions of the inner leads, and a part of the surface of the protruded portion where the insulating thin film has not been formed functions as an external terminal.
12. (Original) A resin-encapsulated semiconductor device, wherein a plurality of resin-encapsulated semiconductor devices according to claim 4 are stacked on top of each other, and in adjacent pairs, back faces of inner leads of one are connected electrically with surfaces of protruded portions of an other.
13. (Original) The resin-encapsulated semiconductor device according to claim 12, wherein at least three resin-encapsulated semiconductor devices are stacked on top of each other.

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14. (Withdrawn) A method of producing a resin-encapsulated semiconductor device,

using a lead frame that includes a frame and a plurality of inner leads that extend inward from the frame, the inner lead having a protruded portion provided on a surface of its outer portion, and the protruded portion protruding in a thickness direction and being provided with a step portion formed in its side portion, the method comprising:

forming first electroconductive bumps on surfaces of the inner leads on an inner side relative to their protruded portions;

stacking a second semiconductor chip having a smaller size than that of a first semiconductor chip, on a surface of the first semiconductor chip, and electrically connecting a first group of electrodes of the first semiconductor chip with a group of electrodes of the second semiconductor chip through second electroconductive bumps;

electrically connecting the first electroconductive bumps with a second group of electrodes of the first semiconductor chip formed on an outer side relative to a region of the first semiconductor chip to which the second semiconductor chip has been connected; and

encapsulating a region including surfaces of the first and second semiconductor chips and the first and second electroconductive bumps with an encapsulating resin with surfaces of the protruded portions being substantially in the same plane as an outer face of the encapsulating resin and being exposed from the encapsulating resin.

15. (Withdrawn) The method of producing a resin-encapsulated semiconductor device according to claim 14, further comprising, after encapsulating the region, cutting off a portion sticking out from the encapsulating resin of the inner leads to separate a structure encapsulated with the resin from the frame.

16. (Withdrawn) The method of producing a resin-encapsulated semiconductor device according to claim 14, wherein in encapsulating the region, the encapsulating resin is fed with a resin sheet being in close contact at least with the protruded portions.

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17. (Withdrawn) A method of producing a resin-encapsulated semiconductor device, using a lead frame that includes a frame and a plurality of inner leads that extend inward from the frame, the inner lead having a protruded portion provided on a surface of its outer portion, and the protruded portion protruding in a thickness direction and being provided with a step portion formed in its side portion, the method comprising:

forming first electroconductive bumps on surfaces of the inner leads on an inner side relative to their protruded portions;

stacking a second semiconductor chip having a smaller size than that of a first semiconductor chip, on a surface of the first semiconductor chip, and electrically connecting a first group of electrodes of the first semiconductor chip with a group of electrodes of the second semiconductor chip through second electroconductive bumps;

electrically connecting the first electroconductive bumps with a second group of electrodes of the first semiconductor chip formed on an outer side relative to a region of the first semiconductor chip to which the second semiconductor chip has been connected; and

encapsulating a region including surfaces of the first and second semiconductor chips and the first and second electroconductive bumps with an encapsulating resin.

18. (Withdrawn) The method of producing a resin-encapsulated semiconductor device according to claim 17, further comprising, after encapsulating the region, cutting off a portion sticking out from the encapsulating resin of the inner leads to separate a structure encapsulated with the resin from the frame.

19. (Withdrawn) The method of producing a resin-encapsulated semiconductor device according to claim 17, wherein in encapsulating the region, the encapsulating resin is fed with a resin sheet being in close contact at least with the protruded portions.

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20. (New) The lead frame according to claim 1, wherein a back face of each of the inner leads, just below the protruded portion, forms the lowest part of the inner leads.

21. (New) The lead frame according to claim 2, wherein a back face of each of the inner leads, just below the protruded portions, forms the lowest part of the inner leads.